REMARKS

Claims 1, 2, 7-9, 13-17 and 25-64 are pending. By the Office Action, claims 2-6, 10-13 and 16-26 are withdrawn from consideration, and claims 1, 7-9, 14 and 15 are rejected. By this Amendment, claims 3-6, 10-12 and 18-24 are canceled, claims 1-2, 7-9, 13-17 and 25-26 are amended and claims 27-64 are added. In view of the foregoing amendments and the following remarks, reconsideration and allowance are respectfully requested.

The attached Appendix includes marked-up copies of each rewritten claim (37 C.F.R. §1.121(c)(1)(ii)).

I. Claim Restriction

Applicants appreciate the clarification, in this Office Action, of the restriction and election of species requirements originally set forth in the February 16, 2001 Office Action. This restriction requirement established Groups I-VI. Specifically, Group I included claims 1-17 and 22, drawn to nucleic acids corresponding to various regions of the retroviral genome. The restriction requirement further required Applicants to identify and elect only those nucleotide sequences corresponding to a single structural (gag, pol, env) and regulatory region (LTR) of the viral genome.

In response, Applicants elected Group I claims 1-17 and 22, with traverse, selected the env gene, and indicated SEQ ID NO: 6, SEQ ID NO: 9, and SEQ ID NO: 12, as nucleotide sequences corresponding to the elected region. As is clear from the specification, for example, page 5, lines 16-18, page 13, lines 1-9, page 19, lines 25-29, and FIGS. 3-5, SEQ ID NO: 7, SEQ ID NO: 10, and SEQ ID NO: 13 also represent polypeptide sequences corresponding to the elected region. Thus, included within Group I are claims 2, 16 and 17, drawn to polynucleotides encoding the aforementioned SEQ ID NO: 7, 10 and 13 polypeptides. In addition to claims 1, 7-9 and 14-15, Applicants respectfully request the rejoinder and consideration of at least claims 2, 16, and 17.

The February 16, 2001 Office Action further restricted Group V, claim 25, drawn to a prophylactic or therapeutic composition comprising the viral nucleic acid fragments, and Group VI, claim 26 drawn to detection methods employing the viral nucleic acid fragments. However, it is respectfully submitted that the subject matter of Groups V and VI should be examined together with the subject matter of Group I. The composition of claim 25, and the method of claim 26, each include all to the limitations of the product of claim 1. In particular, all of the polynucleotide sequences of claim 1 (i.e., every SEQ ID NO) are incorporated into the prophylactic or therapeutic composition of claim 25, and into the method of claim 26.

The February 16, 2001 Office Action alleged that the inventions listed as Groups I-VI do not relate to a single inventive concept because they lack the same special technical feature. The Office Action stated, inter alia, that each of the identified sequences is derived from a different region of the retroviral genome and will contain a unique structure and function.

Under the rules of practice in PCT national stage applications, a single application may include one invention, or more than one invention if the inventions are "linked as to form a single general inventive concept." MPEP §1893.03(d) (emphasis added). If multiple inventions are included in the application, they are deemed to be linked if there exists a "technical relationship among the inventions that involves at least one common or corresponding special technical feature." Id. As long as a common technical feature and single inventive concept applies to the asserted group of claims, unity of invention exists and restriction can not be required.

As detailed in the above remarks, Applicants have formed a single inventive concept. Applicants elected a single region of the viral genome, the env gene, and have indicated the SEQ ID NOs corresponding to this region. Each of claims 25 and 26 share a common technical feature, i.e., the polynucleotides represented by the recited SEQ ID NOs. Thus,

Applicants have satisfied the unity of invention requirements that have been set forth for the examination of PCT applications.

Furthermore, as originally set forth in the July 16, 2001 Amendment, Applicants continue to respectfully assert that the search and examination of at least claims 1, 2, 7-9, 14-17 and 25 and 26 could be made without serious burden. MPEP §803 states that "[i]f the search and examination of an entire application can be made without serious burden, the Examiner must examine it on the merits, even though it includes claims to distinct or independent inventions." (Emphasis added). Because Applicants have elected Group I, selected the env gene, and indicated the SEQ ID NOs corresponding to this region of the viral genome, the further search and examination of Group V (claim 25), directed to a prophylactic or therapuetic composition comprising nucleic acid having the SEQ ID NOs, and of Group VI (claim 26), directed to detection methods employing nucleic acid having the SEQ ID NOs, would not place a serious burden upon the Examiner.

For at least these reasons, and in order to avoid unnecessary expense and delay to Applicants and duplicative examination by the Patent Office, it is respectfully requested that the Restriction Requirement be reconsidered and withdrawn.

II. Claim rejection under 35 U.S.C. §112, second paragraph

The Office action rejects claims 1, 7-9, 14 and 15 under 35 U.S.C. §112, second paragraph. Applicants respectfully traverse the rejection.

The Office Action asserts that "nucleic material" recited in claims 1 and 7-9 is vague and indefinite. Amended claim 1 recites an "isolated polynucleotide" and claims 7-9 recite "an isolated retroviral polynucleotide," as suggested in the Office Action. As such, claims 1 and 7-9 satisfy the requirements of 35 U.S.C. §112, second paragraph. Accordingly, Applicants respectfully request reconsideration and withdrawal of this aspect of the rejection.

The Office Action asserts that "at least 50%, and preferentially at least 70%" in claims 1, 9, 14 and 15 is vague and indefinite. Amended claims 1, 9, 14 and 15, as well as claims 2

and 16-17, delete the phrase drawn toward the preferred 70% identity. Thus, these claims satisfy the requirements of 35 U.S.C. §112, second paragraph. Applicants respectfully request reconsideration and withdrawal of this aspect of the rejection.

The Office Action asserts that the reference in claim 7, to a nucleotide sequence "identical or equivalent" to SEQ ID NO: 9, is confusing, alleging that the precise structural characteristics of the claimed nucleic acid are not readily manifest. Amended claim 7 removes the "identical or equivalent" phrase. Claim 7 recites, inter alia, that the nucleotide sequence is selected from the group consisting of: "SEQ ID NO: 9 ... and sequences having for every series of 100 contiguous monomers, at least 50% identity with said nucleotide sequences..." Applicants respectfully request reconsideration and withdrawal of this aspect of the rejection.

The Office Action asserts that the phrase "sequences equivalent to" in claims 1, 14 and 15 are vague and indefinite. Similar to the amendment to claim 7, amended claims 1, 14 and 15 remove the denied phrase and recite that the nucleotide sequences in group member (iii) include "sequences having, for every series of 100 contiguous monomers, at least 50% identity with sequences (i) or (ii)." Claim 1, 14 and 15 satisfy the requirements of 35 U.S.C. §112, second paragraph. Accordingly, Applicants respectfully request reconsideration and withdrawal of this aspect of the rejection.

The Office Action rejects claim 8, asserting that the reference to a gene which begins in one SEQ ID NO and ends in a different SEQ ID NO is confusing. Claim 8 has been amended to clarify the invention. As such, claim 8 satisfies the requirements of 35 U.S.C. §112, second paragraph. Accordingly, Applicants respectfully request reconsideration and withdrawal of this aspect of the rejection.

III. <u>Claim rejection under 35 U.S.C. §112, first paragraph</u>

The Office Action rejects claims 1, 7-9, 14 and 15 as allegedly failing the written description requirement of 35 U.S.C. §112, first paragraph. The Office Action takes the

apparent position that the specification does not provide adequate support for the claimed genus of nucleic acids, i.e., "equivalent sequences with a certain degree of homology, and fragments thereof." Applicants respectfully traverse the rejections.

The specification discloses the characterization of a retrovirus, different from known retroviruses, isolated from patients suffering from multiple sclerosis. In particular, the specification describes the characterization of the genetic material associated with the viral particles and in particular, discloses isolate polynucleotides having the nucleotide sequences SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 9, SEQ ID NO: 12, SEQ ID NO: 16, SEQ ID NO: 21, SEQ ID NO: 30 and SEQ ID NO: 31. The specification further discloses the polypeptides encoded by the above polynucleotides, specifically polypeptides having the peptide sequences SEQ ID NO: 5, SEQ ID NO: 7, SEQ ID NO: 10, SEQ ID NO: 13, SEQ ID NO: 25 and SEQ ID NO: 26.

The specification discloses the expression of recombinant fragments of the isolated polynucleotides in *E. coli* and the characterization by gel electrophoresis of the expressed proteins. Page 23, line 27 to page 24, line 7. The specification further demonstrates that by Western-blot analysis, sera from patients suffering from multiple sclerosis reacted with the recombinant proteins, while sera from healthy individuals did not react. Page 24, Table.

It is known in the art that the nucleotide sequences of retroviruses mutate fairly significantly. Thus, in the context of retroviruses in particular, infringement of claims directed to particular nucleotide sequences is easily avoided. As a result, to provide sufficient coverage, it is necessary to include in the claim coverage sequences that are similar to but not identical to the sequences of any given clone. Thus, the present claims are directed to specifically identified nucleic acid sequences, as well as to sequences having a percent identity therewith, specifically to sequences having for any succession of 100 contiguous monomers, at least 50% identity, and in newly added independent claims at least 70%

identity, with any 100 contiguous monomers of the specifically recited sequences. Page 4, line 26 to page 5, line 2.

To provide written description for a claim, the specification as originally filed must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, the inventors were in possession of the invention as claimed. Vas-Cath, Inc. v. Mahurkar, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991). A written description requirement issue generally involves the question of whether the subject matter of a claim is supported by the disclosure of the application as filed. In the present case, the Examiner has not alleged that the claims are not supported by the language of the present specification. Instead, in alleging that the specification does not provide written description for the claims, the Examiner relies on case law that held that merely identifying a nucleic acid by its principle biological activity, such as reciting a DNA that encodes a particular protein, does not provide written description for that compound.

Specifically, the Examiner relies on University of California v. Eli Lilly & Co., 119 F.3d 1559, 1566, 43 USPQ2d 1398, 1404 (Fed. Cir. 1997), which states that an adequate written description of a DNA "requires a precise definition, such as by structure, formula, chemical name, or physical properties, not a mere wish or plan for obtaining the claimed chemical invention." In Eli Lilly, the Federal Circuit held that a claim directed to human insulin cDNA was not adequately supported by the specification, which merely identified the cDNA by its principle biological activity, i.e., encoding human insulin, and a potential method for isolating it, without describing any structural features of the cDNA. 119 F.3d at 1567, 43 USPQ2d at 1404-05.

Thus, in Eli Lilly, the Federal Circuit held that providing no structural information about the claimed human DNA was insufficient. However, the Federal Circuit has not held that it is necessary to set forth an exact nucleotide sequence for any sequence within the claim, much less for more than one embodiment within a claim, in order to fulfill the written

description requirement, as is suggested in the Office Action. In fact, Eli Lilly clearly supports the opposite conclusion stating that an adequate written description "requires a precise definition, such as by structure, formula, chemical name, or physical properties," clearly indicating that something other than the exact formula can be sufficient to precisely define and thus provide written description for a nucleic acid.

Instead, what is required for written description is a precise definition of the nucleic acid "sufficient to distinguish [the claimed material] from other materials." Eli Lilly, 119 F.3d at 1568, 43 USPQ2d at 1405. The present specification provides a precise definition of the claimed nucleic acid in a manner that is sufficient to distinguish the claimed nucleic acids from other nucleic acids.

Claim 1, for example, recites "[a]n isolated polynucleotide, comprising a nucleic acid having a nucleotide sequence selected from the group consisting of: (i) the sequences SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 9, SEQ ID NO: 12, SEQ ID NO: 16, SEQ ID NO: 21, SEQ ID NO: 30 and SEQ ID NO: 31; (ii) the sequences complementary to sequences (i); and (iii) the sequences having, for every series of 100 contiguous monomers, at least 50% identity with sequences (i) or (ii)."

Unlike the situation in Eli Lilly, the present specification clearly provides more than a mere statement that the claimed nucleotide sequences are part of the invention and reference to a potential method for isolating them. Instead, the specification clearly indicates that the inventors isolated and sequenced the nucleotide sequences of SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 9, SEQ ID NO: 12, SEQ ID NO: 16, SEQ ID NO: 21, SEQ ID NO: 30 and SEQ ID NO: 31. As a result, the present specification is clearly distinguished from the situation in Eli Lilly where a nucleic acid was identified merely by its principle biological activity. Instead, in the present case, the claimed nucleic acids are identified by distinguishing structural characteristics.

In addition to describing these specific sequences, the specification specifically describes nucleotide sequences having at least 50% identity with the recited sequences. This reference to nucleotide sequences having at least 50% identity with the recited sequences clearly provides substantial structural information about all of the sequences recited within the claims. In particular, even though the specification does not set forth the nucleotide sequence of every nucleic acid within the scope of the claims, the specification does provide sufficient structural information to distinguish the claimed nucleic acids from nucleic acids that are outside the scope of the claims, as required by the Federal Circuit in Eli Lilly.

In summary, the specification clearly supports the full scope of claim 1, and claim 1 satisfies the requirements of 35 U.S.C. §112, first paragraph. Under similar reasoning, claims 2 and 7-9 also satisfy the requirements of 35 U.S.C. §112, first paragraph. Accordingly, Applicants respectfully request reconsideration and withdrawal of this aspect of the rejection.

Regarding claim 14, here the claim is drawn to "[a]n isolated fragment comprising a polynucleotide having a nucleotide sequence selected from the group consisting of: (i) the sequences SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 9, SEQ ID NO: 12, SEQ ID NO: 16, SEQ ID NO: 21, SEQ ID NO: 30 and SEQ ID NO: 31; (ii) the sequences complementary to sequences (i); and (iii) the sequences having, for every series of 100 contiguous monomers, at least 50% identity with sequences (i) or (ii)." In other words, claim 14 is similar to claim 1, but drawn to a polynucleotide fragment. Thus, for all of the reasons set forth in the above remarks, the specification supports the full scope of claim 14. Claim 15 depends from claim 14. Accordingly, Applicants request reconsideration and withdrawal of this aspect of the rejection.

One further point, Applicants note that many of the new claims 27-65 are dependent upon claims 1 and 14, but include a different percentage identity feature. For instance claims 27-30 recite "[t]he polynucleotide of claim 1, wherein the nucleic acid has a nucleotide

sequence having for every series of at least 100 contiguous monomers, at least [70-95%] identity with the sequences (i) or (ii)." Because the sequences recited in these new claims have an even closer structural similarity to the specifically recited sequences, the written description provides even more structural information within the scope of these new claims. Therefore, it is respectfully submitted that these more narrowly defined claims are also supported by the present specification.

IV. Conclusion

In view of the foregoing amendments and remarks, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further is desirable in order to place this application in better condition for allowance, the Examiner is requested to contact Applicants' representative at the telephone number listed below.

Respectfully submitted,

William P. Berridge
Registration No. 30,024

H. James Voeller
Registration No. 48,015

WPB:HJV/hs

Attachment:
Appendix

Date: June 25, 2003

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fee due to our Deposit Account No. 15-0461